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EXAMINER

RENNER, CRAIG A

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/661,273

Applicant(s)

KHANNA ET AL.

Examiner

Craig A. Renner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11 September 2003.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to because of the following informality:

In Fig. 1, reference sign "30" should be drawn to the "controller" in order to be consistent with the remainder of the disclosure.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

3. The disclosure is objected to because of the following informalities:

a. In line 1 of claim 2, "adistance" should be changed to --a distance-- for better clarity.

b. In line 5 of claim 17, --the-- should be inserted before "data transfer element-- in order to refer back to its antecedent set forth in line 3 of claim 17.

Appropriate correction is required.

Claim Objections

4. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 20-24 been renumbered 19-23.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 6-7, 9-11, 14-15, 17-19, and 22-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Kuroda (JP 03-168985).

With respect to claims 1-3 and 6-7, Kuroda teaches a hard disk drive comprising a base (6); a cover (7) covering the base; at least one rotatable data storage disk (5) supported on the base; at least one actuator (includes 12, for instance) movably mounted within the base; at least one assembly (includes 2 and 4, for instance) supported by the actuator, the assembly including a slider (4) supported by a suspension (2); and at least one motion limiting element (includes each 13, for instance) positioned to block shock-induced motion of the assembly when the slider is operating in at least an active region of the disk (as shown in FIGS. 1-2, for instance), the motion limiting element being spaced from the suspension such that motion of the suspension away from the disk in the event of a shock when the slider is operating in the region is constrained by the motion limiting element (as shown in FIG. 1, for instance) [as per claim 1]; wherein a distance is established to constrain movement of the suspension away from the disk (as shown in FIG. 1, for instance), such that an air bearing between the slider and disk is not substantially disrupted (as shown in FIG. 1, for instance) [as

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per claim 2]; wherein both the cover and the base are formed with respective motion limiting elements (as shown in FIG. 1, for instance) [as per claim 3]; wherein the disk defines a data storage area and the motion limiting element is arcuate shaped across substantially the entire data storage area of the disk (as shown in FIG. 2, for instance, i.e., in as broad as the term "substantially" may be construed) [as per claim 6]; and wherein the disk defines a data storage area and the motion limiting element extends only across a portion of the data storage area of the disk (as shown in FIG. 1, for instance) [as per claim 7].

With respect to claims 9-11 and 14-15, Kuroda teaches a hard disk drive having a motion limiting element (any 13) mechanically constraining movement of at least one suspension (2) of the disk drive away from a disk (5) of the disk drive in the event of a mechanical shock to the disk drive while operating at least in a protected region of the disk such that an air bearing between a slider supported by the suspension and the disk is not substantially disrupted (as shown in FIG. 1, for instance) [as per claim 9]; wherein the hard disk drive further comprises a base (6); a cover (5) covering the base; and at least one actuator (includes 12, for instance) movably mounted within the base, the suspension being mounted on an end of the actuator (as shown in FIG. 2, for instance) [as per claim 10]; wherein both the cover and the base are formed with respective motion limiting elements (each 13, as shown in FIG. 1, for instance) [as per claim 11]; wherein the disk defines a data storage area and the motion limiting element is arcuate shaped across substantially the entire data storage area of the disk (as shown in FIG. 2, for instance, i.e., in as broad as the term "substantially" may be construed) [as per claim

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14]; and wherein the disk defines a data storage area and the motion limiting element extends only across a portion of the data storage area of the disk (as shown in FIG. 1, for instance) [as per claim 15].

With respect to claims 17-19 and 22-23, Kuroda teaches a data storage device comprising at least one data storage medium (5); at least one data transfer element (4) juxtaposed with the medium for transferring data therebetween; and means (includes 13, for instance, in at least an equivalent structural sense) for mechanically constraining movement of the data transfer element away from the data storage medium in the event of a mechanical shock to the device while operating in a protected region of the medium (as shown in FIG. 1, for instance) [as per claim 17]; wherein the data storage device further comprises a base (6); a cover (7) covering the base; and at least one actuator (includes 12, for instance) movably mounted within the base, the data transfer element being mounted on an end of the actuator (as shown in FIG. 2, for instance) [as per claim 18]; wherein both the cover and the base are formed with respective means for mechanically constraining (includes each 13, for instance, in at least an equivalent structural sense, as shown in FIG. 1, for instance) [as per renumbered claim 19]; wherein the means for mechanically constraining is arcuate shaped across a radial portion of the data storage medium (as shown in FIG. 2, for instance) [as per renumbered claim 22]; and wherein the means for mechanically constraining extends only across an outer radial portion of the data storage medium (as shown in FIG. 2, for instance) [as per renumbered claim 23].

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7. Claims 1-5, 7, 9-13, 15, and 17-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Onda (US 6,417,991).

With respect to claims 1-5 and 7, Onda teaches a hard disk drive comprising a base (11); a cover (23) covering the base; at least one rotatable data storage disk (13) supported on the base; at least one actuator (includes 16 and 17, for instance) movably mounted within the base; at least one assembly (includes 21a and 22a, for instance) supported by the actuator, the assembly including a slider (22a) supported by a suspension (21a); and at least one motion limiting element (includes 33 and/or includes 38, for instance) positioned to block shock-induced motion of the assembly when the slider is operating in at least an active region of the disk (as shown in FIG. 3, for instance), the motion limiting element being spaced from the suspension such that motion of the suspension away from the disk in the event of a shock when the slider is operating in the region is constrained by the motion limiting element (as shown in FIG. 3, for instance) [as per claim 1]; wherein a distance is established to constrain movement of the suspension away from the disk (as shown in FIG. 3, for instance), such that an air bearing between the slider and disk is not substantially disrupted (as shown in FIG. 3, for instance) [as per claim 2]; wherein both the cover and the base are formed with respective motion limiting elements (includes 38 and includes 33, respectively) [as per claim 3]; wherein the motion limiting element is established at least in part by an indent (38) in the cover depending down from a plane defined by the cover (as shown in FIG. 3, for instance) [as per claim 4]; wherein the motion limiting element is established at least in part by a rib (33) in the base rising up from a plane defined by

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the base (as shown in FIG. 3, for instance) [as per claim 5]; and wherein the disk defines a data storage area and the motion limiting element extends only across a portion of the data storage area of the disk (as shown in FIG. 3, for instance) [as per claim 7].

With respect to claims 9-13 and 15, Onda teaches a hard disk drive having a motion limiting element (includes 33 and/or includes 38, for instance) mechanically constraining movement of at least one suspension (includes 21a, for instance) of the disk drive away from a disk (13) of the disk drive in the event of a mechanical shock to the disk drive while operating at least in a protected region of the disk such that an air bearing between a slider supported by the suspension and the disk is not substantially disrupted (as shown in FIG. 3, for instance) [as per claim 9]; wherein the hard disk drive further comprises a base (11); a cover (23) covering the base; and at least one actuator (includes 16 and 17, for instance) movably mounted within the base, the suspension being mounted on an end of the actuator (as shown in FIG. 3, for instance) [as per claim 10]; wherein both the cover and the base are formed with respective motion limiting elements (includes 38 and includes 33, respectively) [as per claim 11]; wherein the motion limiting element is established at least in part by an indent (38) in the cover depending down from a plane defined by the cover (as shown in FIG. 3, for instance) [as per claim 12]; wherein the motion limiting element is established at least in part by a rib (33) in the base rising up from a plane defined by the base (as shown in FIG. 3, for instance) [as per claim 13]; and wherein the disk defines a data storage area and the

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motion limiting element extends only across a portion of the data storage area of the disk (as shown in FIG. 3, for instance) [as per claim 15].

With respect to claims 17-21, Onda teaches a data storage device comprising at least one data storage medium (13); at least one data transfer element (includes 22a, for instance) juxtaposed with the medium for transferring data therebetween; and means (includes 33 and/or includes 38, for instance, in at least an equivalent structural sense) for mechanically constraining movement of data transfer element away from the data storage medium in the event of a mechanical shock to the device while operating in a protected region of the medium (as shown in FIG. 3, for instance) [as per claim 17]; wherein the data storage device further comprises a base (11); a cover (23) covering the base; and at least one actuator (includes 16 and 17, for instance) movably mounted within the base, the data transfer element being mounted on an end of the actuator (as shown in FIG. 3, for instance) [as per claim 18]; wherein both the cover and the base are formed with respective means (includes 38 and includes 33, respectively, for instance, in at least an equivalent structural sense) for mechanically constraining [as per renumbered claim 19]; wherein the means for mechanically constraining is established at least in part by an indent (38) in the cover depending down from a plane defined by the cover (as shown in FIG. 3, for instance) [as per renumbered claim 20]; and wherein the means for mechanically constraining is established at least in part by a rib (33) in the base rising up from a plane defined by the base (as shown in FIG. 3, for instance) [as per renumbered claim 21].

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8. Claims 1-2, 7-10, 15-18, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Eckerd et al. (US 6,091,576).

With respect to claims 1-2 and 7-8, Eckerd teaches a hard disk drive (100) comprising a base (102); a cover (104) covering the base; at least one rotatable data storage disk (108) supported on the base; at least one actuator (includes 112, for instance) movably mounted within the base; at least one assembly (includes 118 and 120, for instance) supported by the actuator, the assembly including a slider (120) supported by a suspension (118); and at least one motion limiting element (includes upper-most downward-facing 138, for instance, as shown in FIG. 5, for instance) positioned to block shock-induced motion of the assembly when the slider is operating in at least an active region of the disk (as shown in FIG. 5, for instance), the motion limiting element being spaced from the suspension such that motion of the suspension away from the disk in the event of a shock when the slider is operating in the region is constrained by the motion limiting element (as shown in FIGS. 2 and 5, for instance) [as per claim 1]; wherein a distance is established to constrain movement of the suspension away from the disk, such that an air bearing between the slider and disk is not substantially disrupted (as shown in FIGS. 2 and 5, for instance) [as per claim 2]; wherein the disk defines a data storage area and the motion limiting element extends only across a portion of the data storage area of the disk (as shown in FIG. 5, for instance) [as per claim 7]; and wherein the motion limiting element is juxtaposed with a load-unload ramp (includes lower-most upward-facing 138, for instance, as shown in FIG. 5, for instance) of the disk drive [as per claim 8].

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With respect to claims 9-10 and 15-16, Eckerd teaches a hard disk drive (100) having a motion limiting element (includes upper-most downward-facing 138, for instance, as shown in FIG. 5, for instance) mechanically constraining movement of at least one suspension (includes 118, for instance) of the disk drive away from a disk (108) of the disk drive in the event of a mechanical shock to the disk drive while operating at least in a protected region of the disk such that an air bearing between a slider supported by the suspension and the disk is not substantially disrupted (as shown in FIGS. 2 and 5, for instance) [as per claim 9]; wherein the hard disk drive further comprises a base (102); a cover (104) covering the base; and at least one actuator (includes 112, for instance) movably mounted within the base, the suspension being mounted on an end of the actuator (as shown in FIGS. 1 and 2, for instance) [as per claim 10]; wherein the disk defines a data storage area and the motion limiting element extends only across a portion of the data storage area of the disk (as shown in FIG. 5, for instance) [as per claim 15]; and wherein the motion limiting element is juxtaposed with a load/unload ramp (includes lower-most upward-facing 138, for instance, as shown in FIG. 5, for instance) of the disk drive [as per claim 16].

With respect to claims 17-18 and 23, Eckerd teaches a data storage device (100) comprising at least one data storage medium (108); at least one data transfer element (includes 120, for instance) juxtaposed with the medium for transferring data therebetween; and means (includes upper-most downward-facing 138, for instance, as shown in FIG. 5, for instance, in at least an equivalent structural sense) for mechanically constraining movement of data transfer element away from the data storage medium in

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the event of a mechanical shock to the device while operating in a protected region of the medium (as shown in FIGS. 2 and 5, for instance) [as per claim 17]; wherein the data storage device further comprises a base (102); a cover (104) covering the base; and at least one actuator (includes 112, for instance) movably mounted within the base, the data transfer element being mounted on an end of the actuator (as shown in FIGS. 1 and 2, for instance) [as per claim 18]; and wherein the means for mechanically constraining extends only across an outer radial portion of the data storage medium (as shown in FIG. 5, for instance) [as per renumbered claim 23].

Claim Rejections/Considerations - 35 USC § 103

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Pertinent Prior Art

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. This includes Day et al. (US 5,239,431), Khanna et al. (US 5,640,290), Yagi et al. (US 5,654,847), Kazmierczak et al. (US 5,982,581), Iida et al. (US 6,373,666), Macpherson et al. (US 6,449,129), McDonald et al. (US 6,473,270), Sharma et al. (US 6,747,843), Fayeulle et al. (US 2002/0003683), and Kim et al. (US 2004/0012885), which each individually teaches a hard disk drive with at least one

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motion limiting element positioned to block shock-induced motion of a head suspension assembly.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig A. Renner whose telephone number is (571) 272-7580. The examiner can normally be reached on Tuesday-Friday 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (571) 272-7579. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Craig A. Renner
Primary Examiner
Art Unit 2652

CAR